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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,697	02/23/2004	Kevin P. Martin	62002-1752	1334

24504 7590 06/16/2005

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EXAMINER

ARANCIBIA, MAUREEN GRAMAGLIA

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/784,697

Applicant(s)

MARTIN ET AL.

Examiner

Maureen G. Arancibia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 12-15 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 16-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-18 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. This application contains claims directed to the following patentably distinct species of the claimed invention:
 - a. Species A: The species of Figure 1, wherein the mechanical support is isolated from the creation of the plasma.
 - b. Species B: The species of Figure 2, wherein the mechanical support is the anode for the creation of the plasma.
2. Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, no claims are generic.
3. Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.
4. Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

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5. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

6. During a telephone conversation with Benjamin Balser on 05/11/2005 a provisional election was made without traverse to prosecute the invention of Species A, claims 1-11 and 16-18. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-15 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

8. The disclosure is objected to because of the following informalities: On Page 1, Line 2, it is suggested to add "now U.S. Pat. No. 6,852,195,".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 2, 5-7, 10, and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,950,376 to Hayashi et al.

In regards to Claim 1, Hayashi et al. teaches an apparatus for dry etching a substrate (Figure 1), comprising: a plasma reactor 15 for containing a plasma; a mechanical support 16 isolated from the creation of the plasma (Figure 1); and an additional structure 30 capable of being electrically biased (Column 5, Lines 57-58), the additional structure disposed within the plasma reactor proximal to the mechanical support (Figure 1), wherein when the plasma reactor contains a plasma, at least a portion of the additional structure extends into the plasma (Column 3, Lines 9-12).

While Hayashi et al. does not expressly state that the apparatus is used for *low-damage anisotropic* dry etching, the apparatus taught by Hayashi et al. is structurally the same as the claimed apparatus, and would be inherently be capable of low-damage anisotropic dry etching. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claim 2, the additional structure 30 is dc electrically biased (Column 5, Lines 57-58).

In regards to Claim 5, the mechanical support is electrically isolated from the plasma creator by insulation 17. (Column 5, Lines 4-8)

In regards to Claim 6, the additional structure is electrically isolated from the mechanical support and the plasma creator by electrically insulating member 32. (Figure 1; Column 5, Lines 51-56)

In regards to Claim 7, the additional structure 30 is dc electrically biased (Column 5, Lines 57-58).

In regards to Claims 10 and 11, the apparatus includes an electrically insulating member 32 disposed on and circumscribing a portion of the mechanical support, and in communication with the additional structure. (Figure 1; Column 5, Lines 51-56)

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. **Claims 3, 4, 8, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. in view of U.S. Patent 5,279,669 to Lee.**

The teachings of Hayashi et al. were discussed above. Hayashi et al. teaches that the additional structure 30 is dc electrically biased (Column 5, Lines 57-58).

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In regards to Claims 3, 4, 8, and 9, Hayashi et al. does not expressly teach that the additional structure can be both ac and dc electrically biased.

Lee teaches that an additional structure 60 can be ac electrically biased. Column 6, Line 50 - Column 7, Line 25)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by Hayashi et al. to be both ac and dc electrically biased. The motivation for doing so, as taught by Lee (Column 6, Line 50 - Column 7, Line 25), would have been to generate a pulsed charged-particle beam with a desired base voltage.

13. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hayashi et al. in view of U.S. Patent 6,231,777 to Kofuji et al. (from Applicant's IDS)

In regards to Claim 16, Hayashi et al. teaches an apparatus for dry etching a substrate (Figure 1), comprising: a plasma reactor 15; a plasma creation means (microwaves, waveguide 12, and gas from inlet 14) at least partially disposed within the plasma reactor (the microwaves and gas enter the reactor) for creating a plasma having positively charged ions and electrons (Column 3, Lines 3-8); a substrate holder 16 disposed within the plasma reactor for receiving a substrate 33, wherein the holder is isolated from the creation of the plasma in chamber 11 (Figure 1); and a charged particle controller means (additional structure 30), the charged particle controller means disposed proximal to the substrate holder (Figure 1).

Hayashi et al. does not expressly state that the apparatus is used for *low-damage anisotropic* dry etching, the apparatus taught by Hayashi et al. is structurally the same as the claimed apparatus, and would be inherently be capable of low-damage anisotropic dry etching. Additionally, the charged particle controller means (additional structure 30) is electrically biased, and would inherently control the flux of charged particles from a plasma passing through it to a substrate 33 disposed on the substrate holder 16 (See Column 2, Lines 60 - Column 3, Line 26). This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

Hayashi et al. does not expressly teach an electron etcher means in electrical communication with the substrate holder.

Kofuji et al. teaches that an etcher means (pulsed electrical bias) is in electrical communication with a substrate holder. (Column 11, Lines 24-38)

It would have been obvious to one of ordinary skill in the art to modify the apparatus taught by Hayashi et al. to include an etcher means in electrical communication with the substrate holder. The motivation for doing so, as taught by Kofuji et al. (Column 11, Lines 34-38), would have been to avoid notching and charge build-up on the substrate during etching. While the combination of Hayashi et al. and Kofuji et al. does not expressly teach that the etching means is an electron etching means for etching the substrate with electrons, the pulsed electrical bias could

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inherently be used to cause electrons to impinge on the substrate. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claim 17, the charged particle controller means (additional structure 30) taught by Hayashi et al. is controllably electrically biased (Column 4, Lines 11-20; Column 5, Lines 57-58). This controllable bias would inherently adapt the charged particle controller to control the energy of charged particles being impacted on the substrate. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

In regards to Claim 18, Hayashi et al. teaches a charged particle blocking means (insulating member 32; Figure 1). This insulating member would inherently prevent charged particles in the plasma from reaching the substrate unless the charged particles pass through the charged particle controller means. This rejection is based on the fact the apparatus structure taught above has the inherent capability of being used in the manner intended by the Applicant. When a rejection is based on inherency, a rejection under 35 U.S.C. 102 or U.S.C. 103 is appropriate. (See *In re Fitzgerald* 205 USPQ 594 or MPEP 2112).

Double Patenting

14. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

15. Claims 1-9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 34-37 of U.S. Patent 6,033,587.

Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims in the present application are essentially similar to the claims in U.S. Patent 6,033,587.

16. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being obvious over U.S. Patent 6,033,587 to Martin et al.

The applied reference has a common assignee and common inventors with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is

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thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). This rejection might also be overcome by showing that the reference is disqualified under 35 U.S.C. 103(c) as prior art in a rejection under 35 U.S.C. 103(a). See MPEP § 706.02(I)(1) and § 706.02(I)(2).

Martin et al. teaches an apparatus (Figure 1) for low-damage anisotropic dry etching of a substrate, the apparatus comprising: a plasma reactor; a mechanical support 12 isolated from the creation of the plasma; and an additional structure 14 capable of being ac and/or dc biased and supported by electrically insulating member 23. (Column 11, Lines 18-56)

Conclusion

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Maureen G. Arancibia whose telephone number is (571) 272-1219. The examiner can normally be reached on core hours of 10-5, Monday-Friday.

18. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone

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number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Maureen G. Arancibia
Patent Examiner, AU 1763



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